

Evaluation of Upper Kissimmee Basin Surface Water Availability

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Purpose of the Study

Investigate potential water availability from Kissimmee Chain of Lakes

- **Identify potential environmental considerations**
 - **Impacts on lake levels**
 - **Effects on S-65 flows**
- **Identify technical issues with withdrawal of water from the system**

Plan of the Presentation

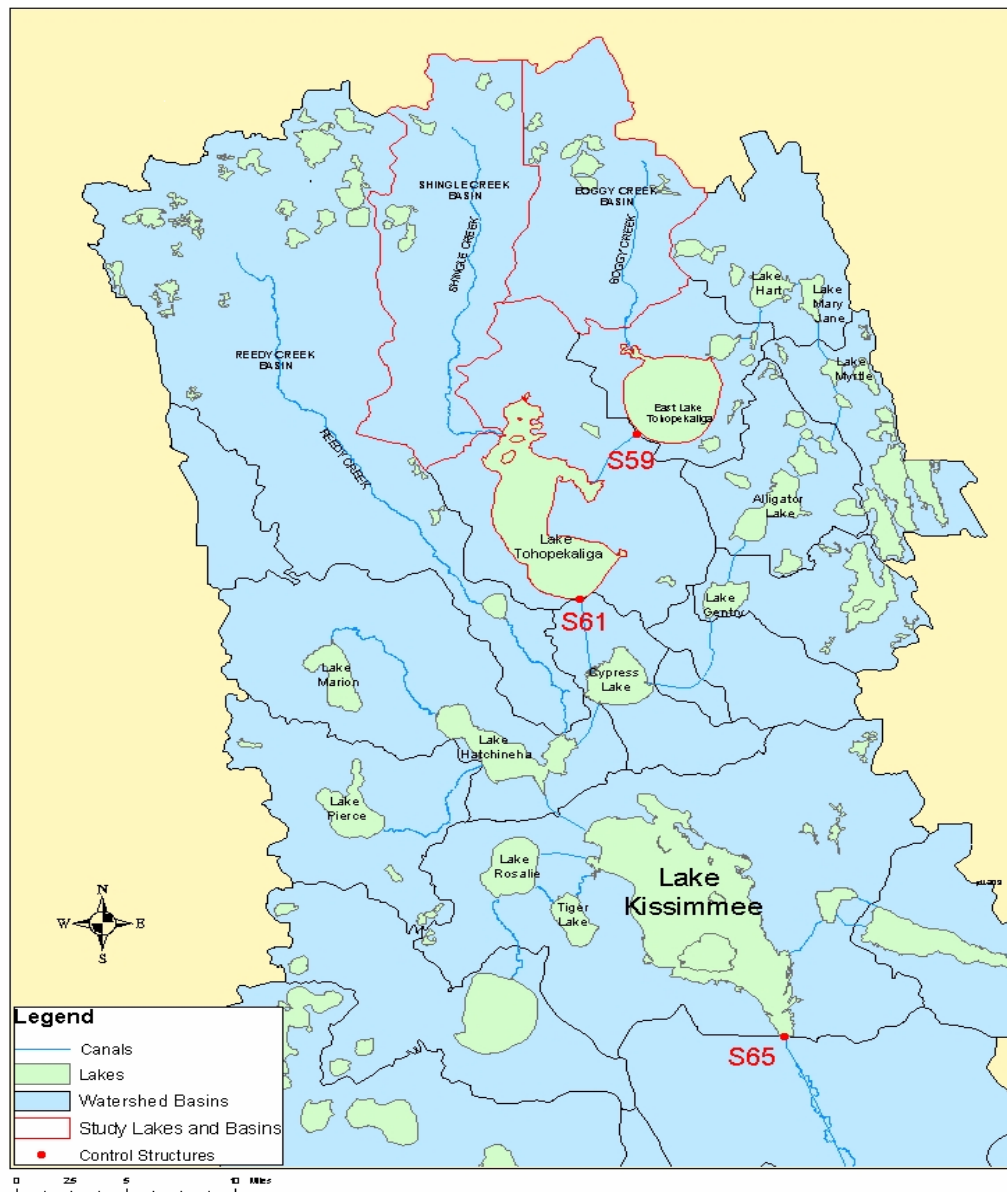
- Basin description
- Present methodologies used to evaluate water availability in lakes
- Identify environmental considerations
- Establish preliminary withdrawal zones
- Measure impacts at S-65 based on the 50 MGD and 100 MGD withdrawal scenarios
- Summary

Upper Kissimmee
1,368 square miles, of
which 176 square miles
are lakes

Lower Kissimmee
2,109 square miles,
of which 44 square
miles are lakes

Lake Toho
30 square miles at 53.7 ft
stage (S-59).

East Lake Toho
20 square miles at 56.3 ft
stage (S-59).



Basin Map

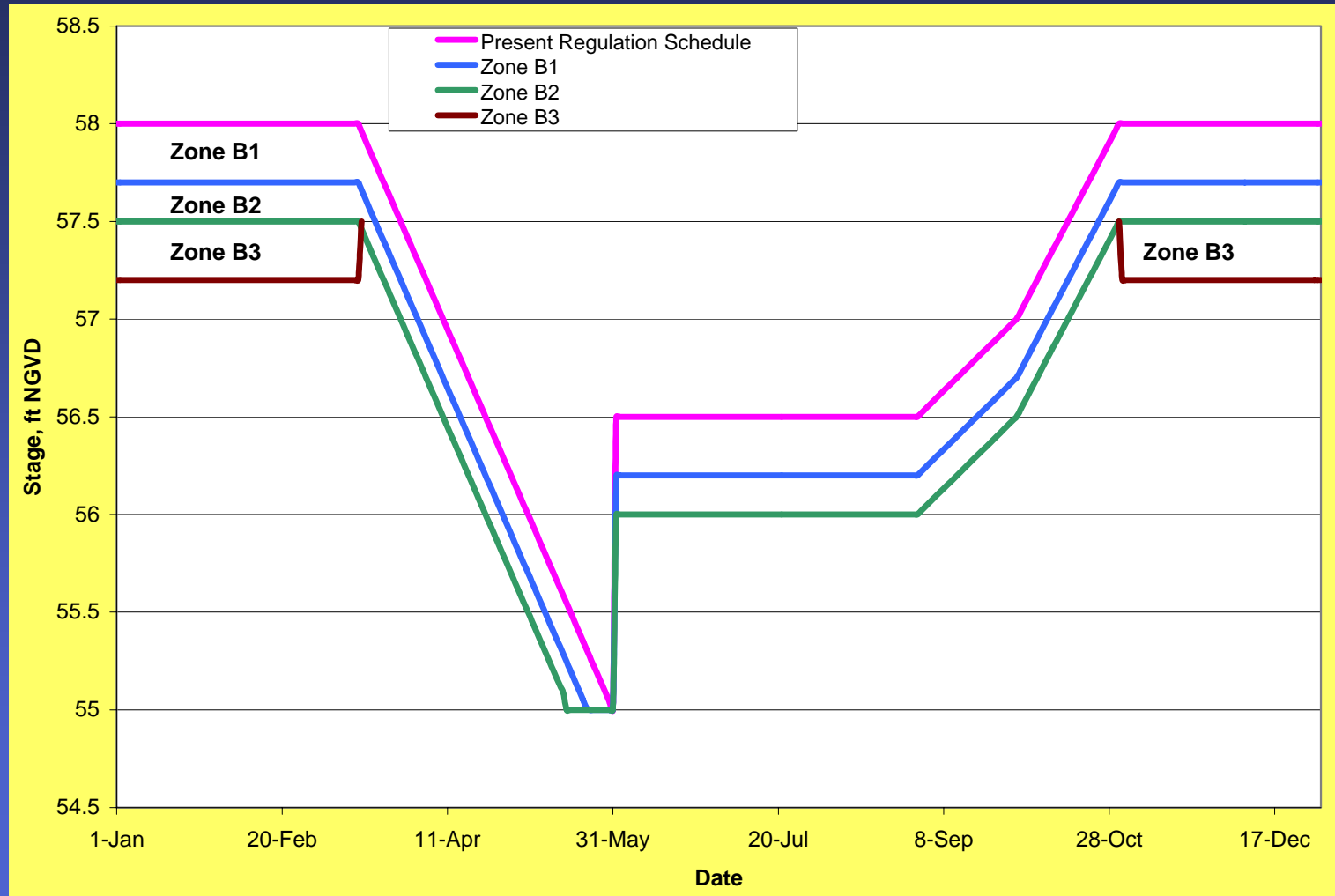
Feasibility Study Criteria

- Evaluate the technical feasibility of surface water availability for potential supply
 - Is surface water available?
 - How will lake levels be affected?
 - How will S-65 flows to the Kissimmee River be affected?

Addressing Environmental Concerns

- Lake Toho and East Lake Toho used as example
 - In-lake water levels addressed by preliminary criteria divided in zones
 - Withdrawals stopped at low point in regulation schedule
- Downstream restoration
 - Maintain desired flow pattern
 - Minimize zero-flow days

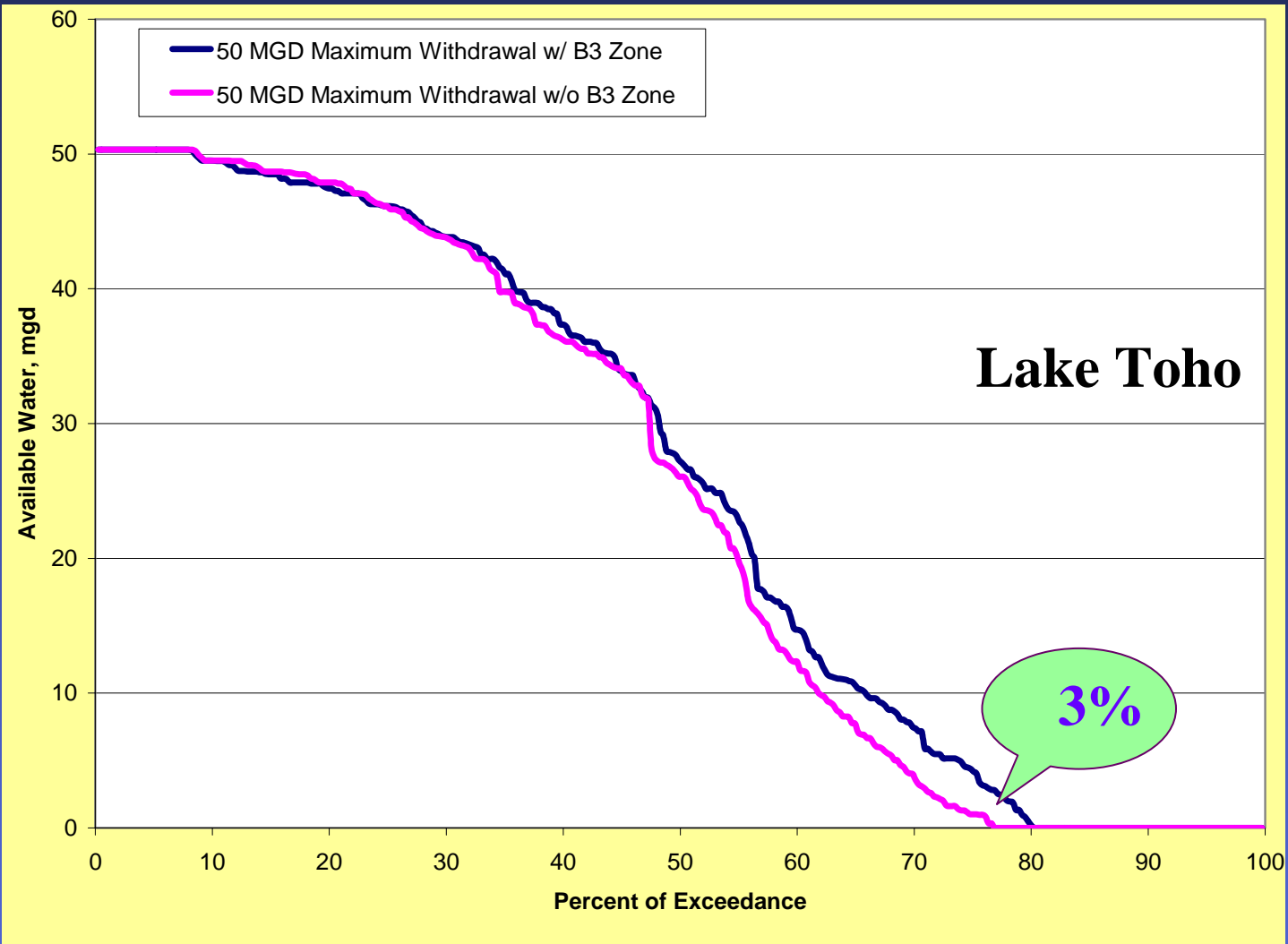
Typical Lake Operation Schedule Based on the Present Regulation Schedule



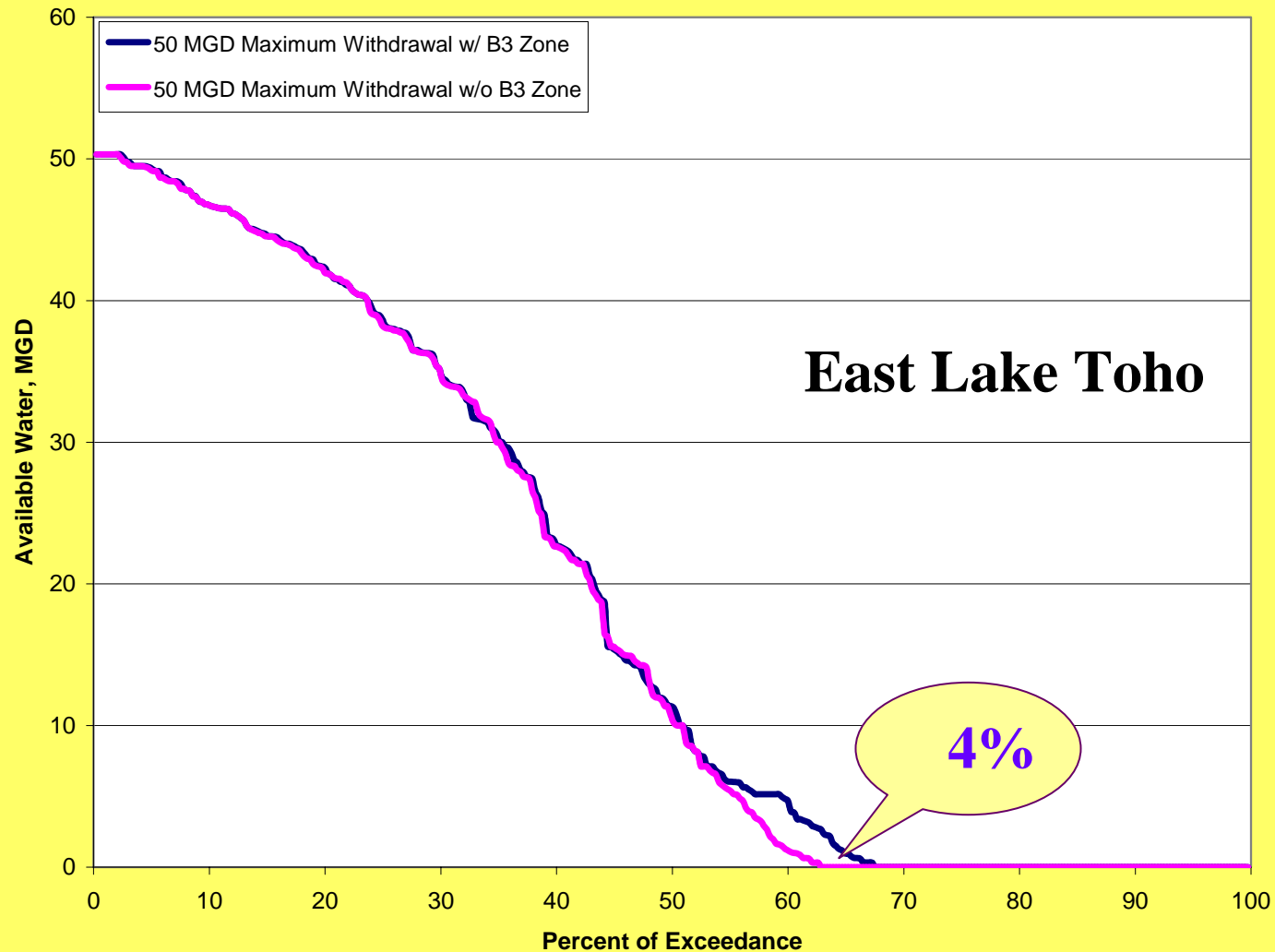
Operation Zones and Maximum Withdrawal Rates in the Lakes

Zones	Diversion Rate (MGD) in Different Scenario				
	1A	1B	2A	2B	
Above Regulation	50	50	100	100	
B1, regulation schedule to 0.3 ft below	25	25	50	50	
B2, Zone B1 to 0.2 ft below	15	15	15	15	
B3, Zone B2 to 0.3 ft below	5	—	5	—	

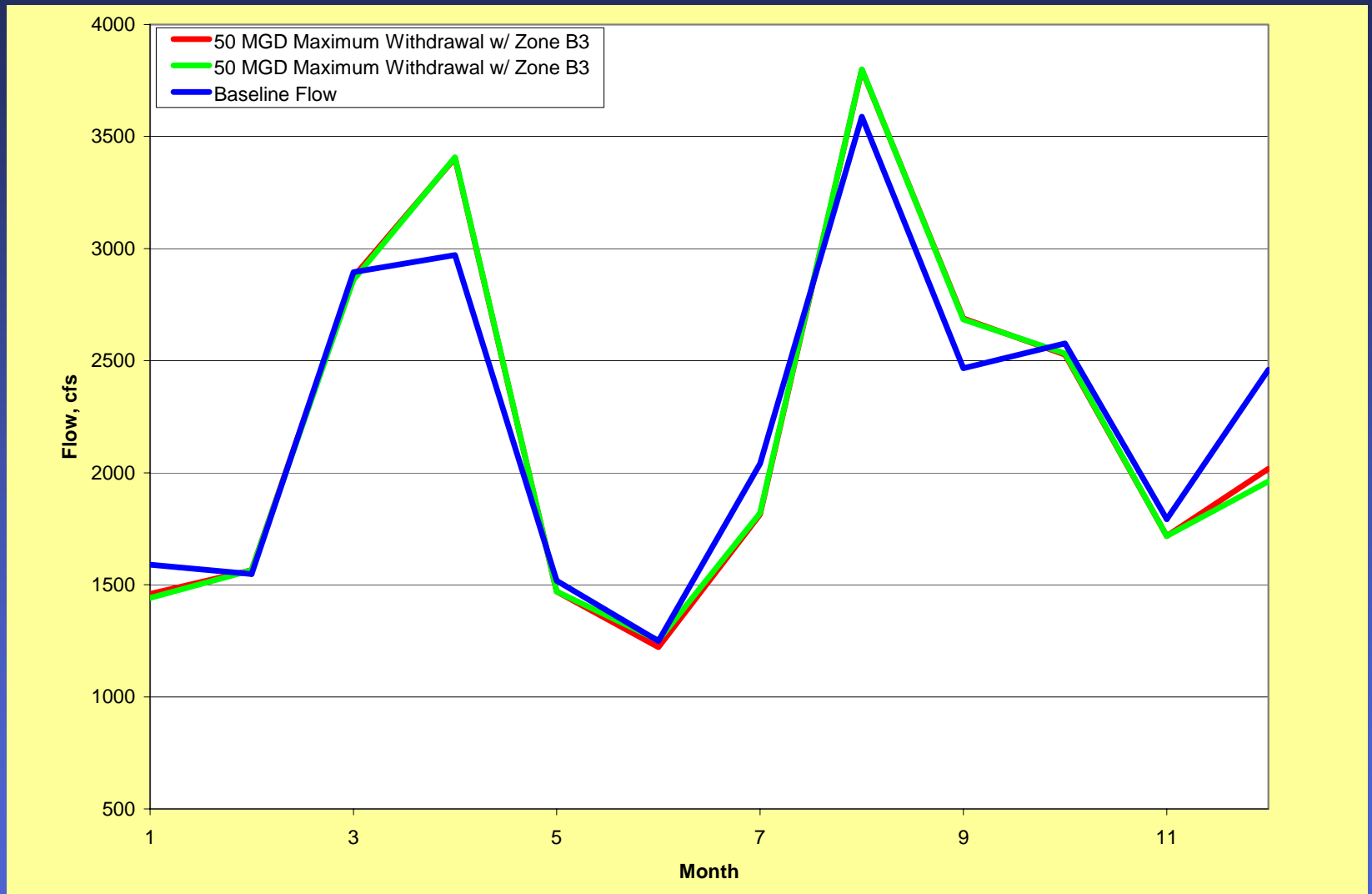
Available Flow Reliability



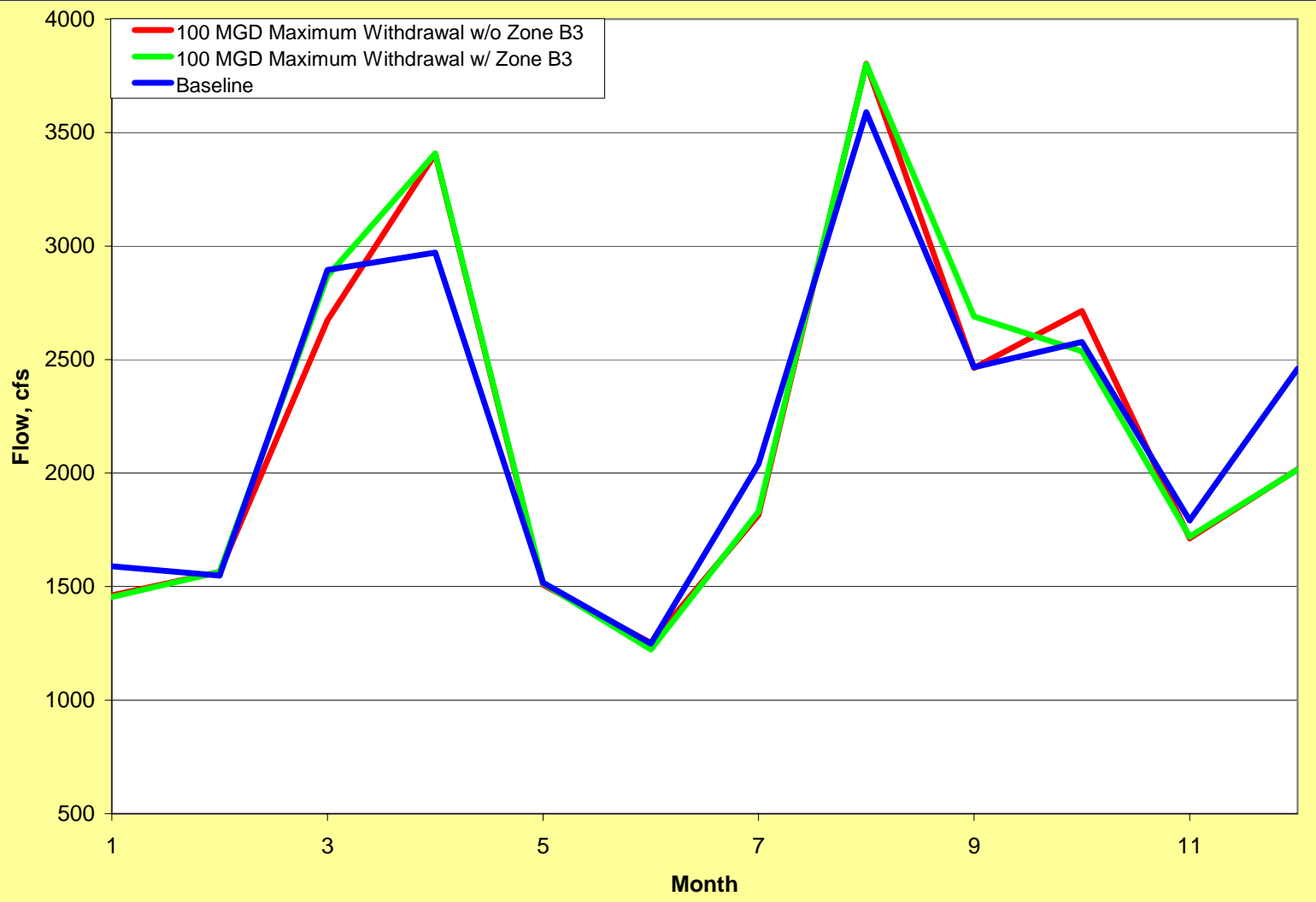
Available Flow Reliability



S-65 Monthly Average Discharge Frequency at 90% Time Equal or Less with 50 MGD Maximum Withdrawal



S-65 Monthly Discharge Frequency at 90% of Time Equal or Less with 100 MGD Maximum Withdrawal at Lake Toho and East Lake Toho



Monthly Average Flow Frequency at S-65

Scenario (1970-2001)	10% Time Equal or Less	50% Time Equal or Less	90% Time Equal or Less
Baseline	77 – 357 cfs	400 – 1,038 cfs	1,249 – 3,589 cfs
50 MGD Diversion			
w/ Zone B1, B2	82 – 345 cfs	400 – 1,000 cfs	1,222 – 3,799 cfs
w/ Zone B1, B2, B3	77 – 324 cfs	400 – 1,000 cfs	1,222 – 3,799 cfs
100 MGD Diversion			
w/ Zone B1, B2	77 – 344 cfs	400 – 1,001 cfs	1,252 – 3,804 cfs
w/ Zone B1, B2, B3	77 – 342 cfs	400 – 1,004 cfs	1,223 – 3,801 cfs

Events and Days of Zero-Flow at S-65

	Number of Events	Total of Zero Flow Days	Maximum Consecutive Days
Baseline (No Flow)	12	283	134
50 MGD Maximum Diversion Scenarios			
w/ Zone B3	15	326	150
w/o Zone B3	16	324	144
100 MGD Maximum Diversion Scenarios			
w/ Zone B3	17	327	144
w/o Zone B3	16	321	144

Event = Occurrence no flow at S-65 for 5 or more days

Summary

- Study evaluated different withdrawal rates, including 50 and 100 MGD scenarios
- Three withdrawal zones were used: B1, B2, and B3
- Withdrawal from the lakes increases the number of no-flow events by up to 5 events over a 30 year period
- Withdrawal reliability is between 60 - 75% under “zoned” withdrawal scenario
 - Zone B3 slightly improved reliability by about 4%
- Some potential of water availability from Kissimmee Chain of Lakes
- Storage should be a component of any future consideration

Notes

- Study results are preliminary and will need to tie to long-term management plan for the Kissimmee Basin
- Based on specific assumptions that did not attempt to find the optimal withdrawal scenario
- Assumed regulation schedules
 - Current (Upper Kissimmee Chain of Lakes)
 - Headwater revitalization schedule
- Modifications required for specific applications

Contributors

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The End



Questions?